47. (Twice Amended) A computer executable code for an audio conference server providing multi-point, weight controllable audio conferencing, said code comprising:

a managing section enabling management of at least one audio conference, with said at least one audio conference including a plurality of audio clients;

a receiving section enabling reception of audio data from said plurality of audio clients;

a mixing section enabling the audio conference server to provide spatialized audio to said plurality of audio clients in said at least one audio conference,

wherein said mixing section includes a distance-based attenuation section providing distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of different sound decay characteristics, each different sound decay characteristic providing a different volume/distance relationship, and

wherein said mixing section results in mixed audio data; and

a delivery section enabling delivery of said mixed audio data to said plurality of audio clients in said at least one audio conference.

REMARKS

The application has been reviewed in light of the Office Action dated June 24, 2002. Claims 1, 3-9, 11-18, 20-25 and 45-48 are pending in this application, with claims 1, 7, 9, 17, 18, 24 and 45-48 being in independent form. By the present Amendment, claims 1, 9, 18, 45 and 47 have been amended. It is submitted that no new matter has been added and no new issues have been raised by the present Amendment.

Claims 1, 3-5, 7, 9, 11, 12, 13, 18, 20, 21, 24, 45, 47 and 48 were rejected under 35 U.S.C. 103(a) as allegedly unpatentable over U.S. Patent 5,710,591 to Bruno et al. in view of Cohen et al., IEEE 1993, "Virtual gain for audio windows". Claims 6, 14-16 and 23 were rejected under Section 103(a) as allegedly unpatentable over Bruno et al. in view of Cohen et al. and further in view of U.S. Patent 5,764,750 to Chau et al. Claims 8, 17, 25 and 46 were rejected under Section 103(a) as allegedly unpatentable over Bruno et al. in view of Cohen et al. and further in view of U.S. Patent 5,864,816 to Everett. Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claims 1, 7, 9, 17, 18, 24, and 45-48 are patentable over the cited art for at least the following reasons.

Independent claim 1 relates to an audio conference server for enabling an application program to provide multi-point, weight-controllable audio conferencing. The audio conference server comprises means for managing at least one audio conference, the at least one audio conference comprising a plurality of audio clients, means for receiving audio data from said plurality of audio clients and means for mixing said audio data to provide spatialized audio data to the plurality of audio clients. The mixing means includes means for providing distance-based attenuation according sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of different sound decay characteristics, each different sound decay characteristic providing a different volume/distance relationship and the mixing means results in mixed audio data. The audio conference server also provides means for delivering the mixed audio data to the plurality of audio clients

Bruno et al, as understood by Applicant, relates to a method and apparatus for recording and indexing audio information exchanged during an audio conference call or video,

audio and data information exchanged during a multimedia conference. Voice activated

switching functionality of a multipoint control unit provides a video signal, which is input into

the multipoint control unit from a workstation from which an audio signal is detected, to each

of the other workstations in the conference. A workstation or participant-identification signal

is generated by the multipoint control unit and stored with the audio signal and video

information.

Cohen et al., as understood by Applicant, relates to audio windowing at a frontend, or

user interface, to an audio system with a spatial sound backend. As understood by Applicant,

virtual gain can capture the effects of distance between source and sink. However, Cohen et

al. clearly indicates that rather than adhering strictly to a pure hyperbolic, or inverse,

proportionality, the usual gain $\propto$ 1/distance relation is extended to achieve a "predetermined

falloff across the room", with the "desired behavior" being illustrated in Figure 3 of Cohen et

al.

In contrast, as recited in independent claim 1, at least one sound decay characteristic is

assigned to each audio client from a plurality of different sound decay characteristics, each

different sound decay characteristic providing a different volume/distance relationship.

Cohen et al. *teaches away* from audio clients having different sound decay

characteristics by indicating that the gain/distance relation has a "predetermined falloff" across

the room and that the "desired behavior" is shown in Figure 3 (page 87, right column, last full

paragraph).

Accordingly, Applicant respectfully submits independent claim 1 is patentable over the

cited art.

Independent claims 9, 18, 45 and 47 are believed to be patentable over the cited art

for at least similar reasons.

Independent claim 7 of the present application relates to an audio conference server for enabling an application program to provide multi-point, weight controllable audio conferencing. The audio conferencing system comprises means for managing at least one audio conference, the one audio conference comprising a plurality of audio clients, means for receiving audio data from said plurality of audio clients and means for mixing said audio data to provide spatialized audio data to the plurality of audio clients. The mixing means includes means for providing distance-based attenuation according to sound decay characteristics and the mixing means results in mixed audio data. The audio conference server also provides means for delivering said mixed audio data to said plurality of audio clients. The means for providing distance-based attenuation according to sound decay characteristics comprises means for identifying a decay factor from one of a plurality of pre-defined decay factors and a customized decay factor for each of said plurality of audio clients. The plurality of predefined decay factors includes an audio big decay factor, an audio small decay factor, an audio medium decay factor and a constant decay factor. The means for providing distance-based attenuation according to sound decay characteristics also comprises means for determining distances between a target audio client and a plurality of source audio clients, means for determining a plurality of weighted values for each of said source audio clients based on said identified decay factor and said distance between each of said source audio clients and said target audio client, wherein each of said weighted values corresponds to a source/target audio client pair, means for generating a mix table for each of said source/target audio client pairs, means for calculating an actual mix for said audio target clients and means for refining said actual mix for said target audio clients.

Regarding claim 7, the Examiner contends that Cohen et al. discloses "a continued gradual decay characteristics" and therefore inherently discloses an audio big decay factor, audio small decay factor, an audio medium decay factor and a constant decay factor. Applicant respectfully disagrees.

As understood by Applicant, Figure 3 of Cohen et al. is an evaluation of distance-dependent gain ($gain_{distance}$) at various distances from a source. More specifically, Figure 3 illustrates the desired behavior "to drop from loudest when the objects are touching each other to quiet across the room." (Cohen et al., Page 87-88). However, as clearly indicated in Cohen et al, the distance dependent gain, $gain_{distance}$, between source and sink is determined based on the same characteristic (e.g., that shown in Fig. 3) for all sources and clients.

Cohen et al., is not understood by Applicant to teach or suggest identifying a decay factor from one of a plurality of pre-defined decay factors and a customized decay factor for each of the plurality of audio clients, as recited in independent claim 7.

Cohen et al. is not understood by Applicant to teach or suggest that the plurality of pre-defined decay factors includes an audio big decay factor, an audio small decay factor, an audio medium decay factor, and a constant decay factor, as also recited in independent claim 7.

Accordingly, Applicant respectfully submits that claim 7 is patentable over the cited art.

It is respectfully submitted that claims 17, 24, 46 and 48 are patentable over the art of record for at least similar reasons.

Accordingly, Applicant respectfully submits that the independent claims are patentable over the cited art for at least one or more of the above-mentioned reasons.

The Office is hereby authorized to charge any additional fees which may be required in
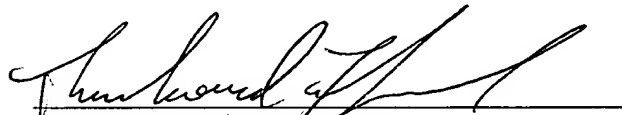
connection with this Request and to credit any overpayment to our Deposit Account No. 03-3125.

If an additional petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition, and the Commissioner is authorized to charge the requisite fees to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is respectfully requested to call the undersigned attorney.

Entry of this Request and allowance of this application are respectfully requested.

Respectfully submitted,

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Please amend claims 1, 9, 18, 45 and 47 as follows:

1. (Three Times Amended) An audio conference server (ACS) for enabling an application program to provide multi-point, weight controllable audio conferencing, the ACS comprising:

means for managing at least one audio conference, said at least one audio conference including a plurality of audio clients;

means for receiving audio data from said plurality of audio clients;

means for mixing said audio data to provide spatialized audio to said plurality of audio clients in said at least one audio conference,

wherein said mixing means includes means for providing distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of <u>different</u> sound decay characteristics<u>, each different sound decay characteristic providing a different volume/distance relationship</u>, and

wherein said mixing means results in mixed audio data; and

means for delivering said mixed audio data to said plurality of audio clients in said at least one audio conference.

9. (Three Times Amended) A method for enabling an audio conference server ACS to provide an application program with multi-point, weight controllable audio conferencing, comprising:

(1) managing at least one audio conference, said at least one audio conference comprising a plurality of audio clients;

(2) receiving audio data from said plurality of audio clients;

(3) mixing said audio data to provide spatialized audio to said plurality of audio clients in said at least one audio conference,

wherein said mixing includes providing distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of <u>different</u> sound decay characteristics, each different sound decay characteristic providing a different volume/distance relationship, and

wherein said mixing results in mixed audio data; and

(4) delivering said mixed audio data to said plurality of audio clients in said at least one audio conference.

18. (Three Times Amended) A computer program product comprising a computer useable medium having computer program logic recorded thereon for enabling an audio conference server (ACS) to provide an application program with muilti-point, weight controllable audio conferencing, said computer program logic comprising:

means for enabling the computer to manage at least one audio conference, said at least one audio conference comprising a plurality of audio clients;

means for enabling the computer to receive audio data from said plurality of audio clients;

means for enabling the computer to mix said audio data to provide spatialized audio to said plurality of audio clients in said at least one audio conference;

wherein said mixing means includes means for enabling the computer to provide distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of <u>different</u> sound decay

characteristics, each different sound decay characteristic providing a different volume/distance relationship, and

wherein said mixing means results in mixed audio data; and

means for enabling the computer to deliver said mixed audio data to said plurality of audio clients in said at least one audio conference.

45. (Twice Amended) An audio conference server providing multi-point, weight controllable audio conferencing comprising:

a management device managing at least one audio conference, said at least one audio conference including a plurality of audio clients;

a receiver receiving audio data from said plurality of audio clients;

a mixer mixing said audio data from said plurality of audio clients;

wherein said mixer includes a distance-based attenuation device providing distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of different sound decay characteristics, each different sound decay characteristic providing a different volume/distance relationship, and

wherein said mixer provides mixed audio data; and

an audio data delivery device delivering said mixed audio data to said plurality of audio clients in said at least one audio conference.

47. (Twice Amended) A computer executable code for an audio conference server providing multi-point, weight controllable audio conferencing, said code comprising:

a managing section enabling management of at least one audio conference, with said at least one audio conference including a plurality of audio clients;

a receiving section enabling reception of audio data from said plurality of audio clients;

a mixing section enabling the audio conference server to provide spatialized audio to said plurality of audio clients in said at least one audio conference,

wherein said mixing section includes a distance-based attenuation section providing distance-based attenuation according to sound decay characteristics, at least one sound decay characteristic being assigned to each audio client from a plurality of different sound decay characteristics, each different sound decay characteristic providing a different volume/distance relationship, and

wherein said mixing section results in mixed audio data; and

a delivery section enabling delivery of said mixed audio data to said plurality of audio clients in said at least one audio conference.